

Improved constraints on Heavy Neutral Leptons and Heavy QCD Axions from the ArgoNeuT Experiment

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ArgoNeuT was a 0.24 ton Liquid Argon Time Projection Chamber detector at Fermilab running from 2009 to 2010. It was located along the NuMI neutrino beam and collected six months of data in anti-neutrino beam mode. ArgoNeuT's data-set has been used to perform numerous first neutrino cross-section measurements on argon. It can also be used to probe physics beyond the standard model resulting from high-energy proton fixed-target collisions in the NuMI beam. Searches for two such models have been performed using the ArgoNeuT experiment: Heavy Neutral Leptons produced via decays of tau leptons, and Heavy QCD Axions produced via mixing with standard model mesons. The resulting particles can then propagate along the NuMI beamline and then decay producing a di-muon signature observable in ArgoNeuT. This talk will present the results of these searches, along with the new constraints that can be applied on the Heavy Neutral Lepton and Heavy QCD Axion parameter spaces.

Attendance type

In-person presentation

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